

Abstract of Contribution 696

ID: 696

Symposium

Topics: Cognition

Keywords: cognitive function, children, exercise, programs

Qualitative characteristics of physical-activity interventions on cognition in youth

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An increasing body of literature has emerged investigating the importance of considering the qualitative characteristics of physical-activity (PA) interventions in research examining the effects of PA on motor and cognitive development. This symposium will provide an overview of the literature regarding the role of cognitively challenging PA interventions on whole-child development from multiple research lenses and the translation of research into practice. The first presentation by Kimberley Lakes will describe how unique PA interventions can be developed for children with neuro-developmental disorders and will describe quantitative and qualitative methods that can be used to analyse the qualitative features of PA interventions. The second presentation by Spyridoula Vazou will focus on the growing body of research on the integration of PA with learning in the classroom and the effects of different types of classroom-based PAs on cognition. The third presentation will describe a novel approach to increase PA in youth, named exergaming. Valentin Benzing will provide an overview of exergaming and its impact on cognition in youth. The fourth presentation by Caterina Pesce will share the results of a series of studies on quality physical education for motor and cognitive development and how the "Joy of Moving" program was scaled up from efficacy to effectiveness and to dissemination at a national institutionalization level. Collectively, this symposium will provide a better understanding of the qualitative characteristics of PA interventions and how we could advance research on how to develop, implement, and study effective and engaging interventions for youth.

Presentations of the Symposium

Physical-activity interventions and the promotion of whole-child development in children with neuro-developmental disorders

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Careful development and analysis of the qualitative characteristics of physical activity (PA) interventions are especially important for children with special needs. Children with developmental and physical challenges often have greater difficulty accessing and participating in PA, which may widen gaps between them and their typically developing peers in both psychological and physical functioning over time. A better understanding of the qualitative characteristics of PA interventions would advance research on how to develop and implement effective and engaging interventions for these groups of vulnerable children. We are studying how PA programs can be developed with a focus on (1) enhancing participant engagement by building on strengths, rather than simply targeting deficits, (2) building supportive learning environments, (3) structuring intervention activities to engage self-regulatory processes while promoting motor development, and (4) using differentiation and scaffolding to ensure individual progress. Using research from several intervention studies conducted with children who have neuro-developmental disorders (e.g. Attention Deficit Hyperactivity Disorder, Autism Spectrum Disorder, Cerebral Palsy), I will illustrate how unique interventions were developed and studied, with a particular focus on results from analyses of the qualitative characteristics of PA interventions using both video-recordings of intervention sessions and interviews with program participants. This work has implications for interventions designed specifically for children with special needs as well as for differentiation within existing PA programs to help facilitate both engagement and individual development.

Integrating physical activity in the classroom is not a break: Effects on learning and cognition

Spyridoula Vazou

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There is an increasing interest for schools to adopt a whole-of-school approach regarding physical activity (PA), meaning infusing PA throughout the school day, including the academic classroom. The growing body of research indicates that PA in the academic classroom is feasible but may also provide an opportunity to increase PA levels in youth and facilitate learning. PA in the classroom can be implemented as an activity break with low levels of cognitive engagement or in integration with the academic subject with high levels of cognitive engagement and/or relevance to the academic content. Although research consistently shows that PA benefits cognition and learning, research on the qualitative characteristics of different types of classroom-based PA and their effect on cognition is limited. This presentation will provide a systematic review of the literature on the effect of different types of PA in the academic classroom on cognition and learning in youth. The presentation will focus on the effectiveness of classroom-based PA interventions on cognition as well as on the differences between the types of PAs that can be implemented in the classroom. Further, we will qualitatively analyse the studies by considering features of each intervention in light of strategies, facilitators and barriers for successful implementation. By understanding the different qualitative characteristics of classroom-based PAs, both research and educational practices will be further informed and developed in order to promote learning and cognitive function in children and adolescents.

Exergaming to enhance cognitive functions in children and adolescents?

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Many children and adolescents in Europe are not reaching the recommended amount of physical activity, whilst sedentary screen time is increasing continuously. Since physical activity seems not only to impact physical health, but also cognitive functions (Lubans et al., 2016), innovative approaches to increase physical activity in children and adolescents are warranted. Assuming that exergaming might have the potential to positively impact physical activity levels by replacing sedentary screen time, in the last decade, the interest in exergaming, or active video gaming, is growing. Exergaming is a portmanteau of "exercise" and "game" and refers to "digital games that require body movements to play, stimulating an active gaming

experience to function as a form of physical activity" (Benzing & Schmidt, 2018). Since exergaming has shown to be able to increase physical activity levels, exergaming in children and adolescents may also benefit cognition. However, the available empirical evidence on the effects of exergaming on cognition in children and adolescents is very limited. Therefore, the aim of this presentation is to give an overview of (a) our own studies as well as related research on acute and chronic exergaming, covering its impact on cognition in children and adolescents (including two longitudinal investigations on the effects of exergaming on cognitive performance in children with ADHD and childhood cancer survivors), and (b) to derive important factors on exergaming to enhance cognitive functions in children and adolescents.

From locally to globally: A whole-child initiative of qualitatively-enriched PE for motor and cognitive development

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This presentation aims to describe a whole-child initiative of quality physical education that pursues goals of motor and cognitive development jointly. This initiative, named "Joy of Moving", builds on qualitative enrichment in physical education. The qualitative characteristics of designed physical activity experiences as novelty, diversification, and complexity are exploited to generate a cognitively optimal challenge point. We started by testing small samples to move on with a replication study and finally expand to a large scale in the actual national institutionalisation phase.

First studies have demonstrated the efficacy of "Joy of Moving" for promoting motor and cognitive development jointly, as well as for enhancing creativity and reducing anti-social behaviours in the school-learning context. A further effectiveness study has identified the starting point for a national replication study performed with an ecological, participative evaluation approach. This latter consists of multiple levels of information gathered from the different actors from the school to the community level: school teachers and principals, parents, school coordinators of the "Joy of Moving", and local and regional coordinators of physical education. Key elements of this mixed process and outcome evaluation were an initial needs analysis and the evaluation of facilitators, constraints and barriers acting on the implementation. To spread globally with models of holistic child development through enriched physical education, we propose to rely on an advanced paradigm that considers the bidirectional relationship between implementation and adaptation and the need for impact evidence to be applied in new implementation contexts.